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Attitudes of farmers and veterinarians towards pain and the use of pain relief in pigs

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Abstract

A survey of UK-based pig farmers and veterinarians was conducted, in order to investigate attitudes to pain and the use of pain relief in pigs. Survey respondents were asked to indicate which anti-inflammatory drugs they used or prescribed for pigs, how often these were administered, and the level of pain they associated with particular conditions. The survey found that veterinarians used a range of anti-inflammatory products to treat pigs with lameness. While both farmers and veterinarians gave similar pain scores overall, farmers rated gastrointestinal disease as more painful and conversely veterinarians scored lameness higher. Female and younger respondents gave higher pain scores than males and older respondents.

Overall, farmers and veterinarians had a positive attitude towards pain relief in pigs with the majority agreeing that animals recovered more promptly when pain relief was administered. Most farmers agreed that the recognition and management of pain is an important part of pig husbandry, and many expressed an interest in finding out more about identifying pain in this species as well as the treatment options available. The study highlighted potential barriers to the increased application of pain relief in pigs in that almost one third of veterinarians and two thirds of farmers did not agree that they discussed pain management with each other, while other respondents indicated that they found it difficult to recognise pain in pigs, and did not know how to treat it appropriately.

Keywords: Farmer; Pain; Pig; Survey; Veterinarian

Introduction

Despite recent advances in the assessment of pain in farm animals (Guatteo et al., 2012; Prunier et al., 2013), the application of appropriate pain relief is thought to be low (Flecknell, 2008). Possible reasons for this mismatch include cost, farming culture or tradition, practicality, the availability of and training in the use of analgesic drugs, and restrictions on the use of such compounds in food producing animals (Mellor et al., 2008). Previous studies examining attitudes towards pain and its mitigation in farm animals have found that, in general, females and more recent veterinary graduates gave higher scores when asked to quantify painful conditions (Huxley and Whay, 2006; Laven et al., 2009; Raekallio et al., 2003; Thomsen et al., 2010). In the case of cattle veterinarians, the use of analgesia for certain conditions was associated with higher pain ratings for those conditions (Huxley and Whay, 2006). Cattle farmers in Denmark scored painful conditions higher than veterinarians, but were less in favour of using analgesia, while veterinarians were more likely to agree that cows benefitted from analgesia (Thomsen et al., 2012).

Although the cost of analgesia remains an issue for cattle farmers in the UK, this barrier to their use could be over-estimated by veterinarians (Huxley and Whay, 2007). Other factors potentially negatively impacting on the increased use of analgesia, include a lack of knowledge, and limited drug availability (Whay and Huxley, 2005; Hewson et al., 2007). A number of products are licenced for the treatment of painful conditions in pigs including non-steroidal anti-inflammatory drugs containing the active ingredients meloxicam, ketoprofen, flunixin, sodium salicylate and tolfenamic acid, along with the corticosteroid dexamethasone and the mild analgesic paracetamol (VMD, 2011). These drugs are all classified as POM-V, so must be prescribed by a veterinary surgeon following clinical assessment of the animal or group of animals (NOAH, 2014). However, given that veterinary visits for individual cases of

pigs experiencing pain would not be economically sustainable, once diagnosed and treated by a veterinarian, further cases of the condition can be treated by the farm staff, a record of which is regularly checked by the attending veterinarian.

Given that, to our knowledge, the attitudes of pig farmers and veterinarians towards pain and pain relief in pigs in the UK have never been clearly defined, this survey was established to ascertain these attitudes and identify the scale and frequency of the use of anti-inflammatory drugs in the aleviation of pain in this species.

Materials and methods

Questionnaire design

Separate questionnaires were designed for farmers and veterinarians using Snap software (Snap Surveys Ltd.) in both paper and online (via Snap WebHost) formats. The first section asked farmers about the farm on which they work, and veterinarians about their veterinary practice. Both questionnaires listed the following drugs by active ingredient (brand names were included in the farmer questionnaire): meloxicam, ketoprofen, flunixin, sodium salicylate, tolfenamic acid, dexamethasone and paracetamol. Survey respondents were given the opportunity to identify which drugs they used (both farmers and veterinarians) or prescribed (veterinarians only) for pigs. All respondents were asked to indicate how often ('almost always', 'frequently', 'sometimes', 'rarely', or 'never') they used or prescribed these drugs for lameness in breeding pigs. Veterinarians were given the opportunity to indicate if they had not given advice in relation to lameness, and farmers could record that they had never encountered the condition on their premises.

81 Respondents were also asked to rate eight different conditions with regard to the pain
82 they considered breeding pigs experienced, on an ordinal scale from '0' (no pain) to '10'
83 (very severe pain). Both farmer and veterinarian questionnaires also listed statements about
84 pain and the use of pain relief in pigs, and asked respondents to indicate their level of
85 agreement ('strongly agree', 'agree', 'neither agree nor disagree', 'disagree', or 'strongly
86 disagree'). Questionnaires also collected other respondent information including: age, gender,
87 percentage of working time spent with pigs, and years of experience working with pigs.
88
89 *Questionnaire distribution*
90 The questionnaires were piloted on five veterinarians and five farmers working at
91 university pig units before they were distributed throughout the UK between September 2012
92 and June 2013. Several distribution methods were used in order to maximise the
93 questionnaire's 'reach'. E-mail invitations to participate along with one week reminders,
94 containing a link to the online questionnaire were automatically sent to 129 veterinarians
95 using Snap WebHost. Paper copies, along with a postage-paid envelope, were also sent out to
96 10 veterinary practices whose websites indicated that they worked with pigs. Twenty-nine
97 members of the Scottish professional pig managers group were also e-mailed a link to the
98 farmer version of the questionnaire, also followed up by one week reminders. Paper copies of
99 the farmer questionnaire were included in the December 2012 issue of *Pig World* magazine[1],
100 which at that time had 4200 subscribers, 3000 of which were pig farmers (i.e. farm owners,
101 managers and stockpersons). A small number of paper copies of the questionnaire were
102 distributed to pig farmers at BPEX [2] meetings, during veterinary visits to farms, and at the
103 Royal Highland Show[3].

[1] See: www.pig-world.co.uk/
[2] See: www.bpex.org.uk/
[3] See: www.royalhighlandshow.org/

104 *Data analysis*

105 Both on-line and paper responses were transferred into Exel and analysed using
106 Minitab 15 and Genstat (11th Ed.). Spreadsheets were cross-checked to minimise errors and
107 results were considered statistically significant at $P \leq 0.05$, and tendencies discussed at $P \leq$
108 0.1. For the frequency of anti-inflammatory use to treat lameness, counts of farmers and
109 veterinarians in each category ('almost always' to 'never') were tabulated and analysed using
110 a Chi-Square test. Pain scores were analysed for differences between farmers and
111 veterinarians, by gender and age group using ordinal logistic regression. For analysis of
112 agreement between statements relating to perception of pain and use of pain relief, responses
113 were coded between 'strongly agree' (1) and 'strongly disagree' (5), and responses of 'don't
114 know' or 'no response' were treated as missing values, so that differences between farmers
115 and veterinarians could be analysed using Mann-Whitney U tests.

116

117 **Results**

118 Fifty-two questionnaires were completed by veterinarians: 34 online (responses from
119 the e-mailed link to the questionnaire), 18 on paper (from postal questionnaires sent to 10
120 practices). A total of 64 were returned by farmers: 10 online, 54 on paper (12 from the
121 Scottish Professional Pig Managers' Group, 45 through *Pig World* Magazine, and nine from
122 other sources). Assuming the number of veterinarians working with pigs in the UK taken
123 from our database (n = 129) was accurate, the response rate for veterinarians was
124 approximately 40%. If we estimate the farmer questionnaire reached approximately 3000 pig
125 farmers, the response rate for farmers was 2%. Table 1 illustrates respondents by age, gender,
126 and occupation. Of the veterinarians surveyed, 20 worked in mixed practice, 17 in large
127 animal practice, nine in pig practice, two for a pig production company, and one in a small

128 animal practice, for a pharmaceutical company, and in academia, respectively. One
129 respondent did not indicate where they worked.
130
131 Veterinary respondents worked with pigs between 1 and 100% of their time (mean,
132 60.2 ± 41.3%), and had between one and 45 years experience of working with pigs (mean,
133 18.6 ± 12.4 years). Fifty farmer respondents worked on breeder-grower-finisher farms, eight
134 on breeder-weaner farms, two on breeder-grower farms, three had no breeding sows, and one
135 respondent did not say. The mean size of the breeding herd on the farms on which
136 respondents worked was 635 ± 1482 (37493 total breeding pigs). Farmers typically spent
137 between 5 - 100 % of their time working directly with pigs (mean, 66.2 ± 30.8%), and had
138 between 3- 62 years of experience of this type of farming (mean, 30.8 ± 12.5 years).
139
140 *Use of anti-inflammatory drugs*
141 Veterinarians used a greater range of drugs than farmers, with all respondents
142 identifying at least one whereas, 24.6% of farmers did not identify any drug treatment (the
143 majority used only one; Fig.1). The most frequently used drug by active ingredient was
144 meloxicam, followed by dexamethasone, ketoprofen, flunixin, sodium salicylate, paracetamol
145 and tolfenamic acid (Table 2). The distribution of responses from farmers and veterinarians
146 on the use of these compounds for lameness is illustrated in Fig.2. Veterinarians used anti-
147 inflammatories more frequently than farmers for lameness in breeding pigs ($\chi^2 = 15.42$, $P =$
148 0.004 [47 farmers and 51 veterinarians]).
149
150 *Pain scoring*
151 The distribution of pain scores given by farmers and veterinarians for various
152 conditions is given in Fig. 3 and Table 3. Overall, scores did not differ between farmers and

153 veterinarians, although veterinarians allocated higher scores for lameness and tended to score
154 higher for normal farrowing, while farmers gave higher scores for cases of gastrointestinal
155 disease. Pain scores differed overall by age group, and for conditions such as leg fractures,
156 infectious mastitis, farrowing (normal and difficult) and gastrointestinal disease, all with
157 younger respondents attributing higher scores. Pain scores also differed by gender, with
158 females scoring significantly higher for both normal and difficult farrowing and 'shoulder
159 sores'.
160
161 *Agreement statements*
162 The levels of agreement with statements about pain and the use of pain relief by
163 farmers and veterinarians are presented in Table 4. There were no differences in the
164 responses of farmers and veterinarians to the statements: 'it is difficult to recognise pain in
165 pigs'; 'pain relief drugs are too expensive for pig farmers to use regularly'; and 'I feel I know
166 enough about pain and how to treat pain in pigs'. Veterinarians tended to disagree slightly
167 more than farmers with the statements: 'there are not enough pain relief drugs available to
168 use in pigs with painful conditions'; and 'pigs are not as sensitive to pain as humans'.
169
170 While overall, respondents agreed with the statement 'pigs recover better with pain
171 relief', veterinarians agreed more strongly, and interestingly 20.3% of farmers either returned
172 a response of 'don't know' or did not reply at all. For the statement 'I regularly discuss pain
173 and pain relief options with pig farmers (for veterinarians) or with my pig veterinarian (for
174 farmers)', veterinarians agreed more than farmers. For the agreement statements only given
175 to farmers, 87.5% agreed or strongly agreed that 'recognising and managing pain is an
176 important part of pig keeping', and 70.3% agreed or strongly agreed that they 'would like to
177 know more about pain and how to treat pain in pigs'. For statements only given to

178 veterinarians, 53.9% agreed or strongly agreed that ‘not enough is known about the benefit of
179 pain relief’, and 51.9% agreed or strongly agreed that they ‘keep up-to-date with the latest
180 literature on pain relief for pigs’.
181
182 **Discussion**
183 The response rate of veterinarians to our survey at 40%, was higher than the 27%
184 response to a survey on attitudes to pain and the use of analgesics in cattle by UK-based
185 veterinarians, although from the much smaller sample population of pig veterinarians
186 practicing in the UK (54 pig vs. 641 cattle veterinarians) (Huxley and Whay, 2006). At 2%,
187 the response rate of farmers was lower than the 15% achieved in an equivalent cattle survey
188 in the UK (Huxley and Whay, 2007). However, the total number of breeding pigs
189 respresented by farmer respondents was 37493, with an average herd size of 635. The
190 average pig herd size (for farms with > five sows) in the UK in 2012 was 153 breeding pigs
191 (DEFRA, 2014), and in December 2013, the UK national herd was 398000 spread over 6100
192 pig holdings (BPEX, 2014). Therefore, the results of the farmer returns represent larger pig
193 farms, some 9% of the UK breeding herd. The method of distribution of the questionnaire to
194 farmers probably introduced selection bias, as individuals interested in reading *Pig World*
195 magazine and/or were attending the Scottish professional pig managers group meetings are
196 likely to be more interested in learning more about pig keeping. There is also likely to have
197 been some bias with the veterinarian questionnaire respondents, as those particularly
198 interested in pain and pain management in pigs may have been more likely to respond.
199
200 The percentage of respondents using anti-inflammatories by active ingredient
201 demonstrates the order of popularity of drugs, which probably represents a balance between
202 cost, availability, efficacy, pharmaceutical form, withdrawal period and other factors. By far

the most frequently used drug was meloxicam, a result also found in a survey of pig farmers in Victoria, Australia (Wilson et al., 2014). This is not surprising as more products containing meloxicam as the active ingredient, compared with the other anti-inflammatory products, are listed on the Veterinary Medicines Directorate product information database (VMD, 2011). In addition, due to a difference in the mode of action of meloxicam compared with other non-steroidal anti-inflammatory drugs, it has low ulcerogenic activity (Engelhardt et al., 1995). The drugs used by the fewest respondents, despite being less expensive, included sodium salicylate and paracetamol, which are only available for oral administration (via feed and water) and tolfenamic acid, which only has one product listed for use in pigs (VMD, 2011).

In this study all veterinarians used or prescribed anti-inflammatories to treat lameness in gilts and sows and 98% used or prescribed anti-inflammatory drugs at least sometimes for lameness, compared with 65.2% of pig veterinarians based in Canada surveyed between 2004 and 2005 (Hewson et al., 2007). Despite no overall difference in pain scores, results differed between farmers and veterinarians in the use of anti-inflammatories: all veterinarians used at least one drug, whereas one quarter of farmers did not use any. Veterinarians used or prescribed anti-inflammatory drugs for lameness more often than farmers used them. It is possible that veterinarians only see severe cases of lameness, so would be more inclined to provide an anti-inflammatory, or that farmers rely on their veterinarians to provide this type of treatment, which could account for this difference. Farmers may only treat severe cases of lameness, as the cost of the products, and the time and practicality of administering them may only seem worthwhile in these severe cases, especially on large farms. Some of the farmer respondents may not have been responsible for drug treatment, so may not have known what products are used on their farms. Compared with farmers, more veterinarians in this study

strongly agreed that pigs recover better with pain relief. Similarly, cattle veterinarians in Denmark agreed more often than farmers that cows benefit from, and recover faster with analgesics (Thomsen et al., 2012). However, 20.3% of the farmers in that survey responded that they did not know or did not reply to this statement, and, given that many do not use any anti-inflammatories, it is possible that they were not aware of the benefits.

Similarly to previous survey studies of veterinarians (Huxley and Whay, 2006; Laven et al., 2009; Lorena et al., 2013; Raekallio et al., 2003), females in this study scored higher than males, and younger respondents gave higher scores. It is interesting that females scored higher for farrowing (both normal and difficult) and shoulder sores, and differences in score by age group varied between conditions. In contrast to a previous study, where farmers scored pain higher than veterinarians for several cattle diseases (Thomsen et al., 2012), here farmers and veterinarians generally gave similar scores for painful conditions in pigs. Farmers did give higher scores to gastrointestinal disease, and veterinarians tended to score higher for lameness and farrowing, but other demographic factors may be influencing these results. Uneven numbers of respondents across combinations of gender, age, and occupation categories, with very few female farmers and older female veterinarians, means interactions between these factors could not be investigated. However, larger studies of cattle veterinarians showed no significant interaction between age group and gender (Huxley and Whay, 2006; Laven et al., 2009), so it is possible that gender and age group differences in this study are independent of one another.

In this study, 64% of veterinarians felt there were enough pain relief drugs available, however, in a previous study in Canada, veterinary respondents agreed that more analgesics are needed for use in livestock (Hewson et al., 2007). This is not surprising as many drugs are

253 currently available in the UK, and veterinarians are able to use other analgesic drugs under
254 the cascade system. In Canada, veterinarians working with pigs agreed slightly overall that
255 owners are not willing to pay for analgesia (Hewson et al., 2007) and 65.3% of veterinarians
256 working in cattle practice in the UK in 2004 agreed that cost is a major issue for cattle
257 farmers (Whay and Huxley, 2005), but in this study, only 29% of veterinarians and 19% of
258 farmers agreed that analgesic drugs are too expensive.
259
260 Thirty-seven per cent of veterinarians and 48% of farmers agreed that they feel they
261 know enough about pain and how to treat pain in pigs, and 52% of veterinarians agreed that
262 they keep up-to-date with the latest literature on pain relief for pigs, whereas only 32% of
263 veterinarians working with pigs in Canada considered their knowledge of analgesia to be
264 adequate (Hewson et al., 2007). However, this does mean that many farmers and
265 veterinarians feel their knowledge about pain and pain management is less than adequate, and
266 feel it is difficult to recognise pain in pigs. Similarly, many veterinarians do not keep up-to-
267 date with the latest literature on pain relief in pigs, which could ultimately negatively impact
268 on its use. Fifty-three per cent of cattle farmers based in the UK agreed that veterinarians and
269 farmers do not discuss pain control in cattle sufficiently (Huxley and Whay, 2007), while in
270 the current study 62% of veterinarians, and approximately half this percentage of farmers
271 agreed that they discuss pain and pain relief options in pigs with each other.
272
273 In a survey of Norwegian dairy farmers, 70% agreed or strongly agreed that ‘animals
274 experience physical pain as humans do’ (Kielland et al., 2010). In the current study, 48% of
275 farmers and 67% of veterinarians disagreed or strongly disagreed that ‘pigs are not as
276 sensitive to pain as humans’. This sentiment could influence the behaviour of farmer towards
277 the management of pain in pigs. Negative attitudes in stockpersons towards pigs correlate

with negative behavioural interactions with this species (Coleman, 1998). Improving such attitudes and modifying human behaviour, resulted in improvements in both the behaviour and productivity of pigs (Hemsworth et al., 1994). A positive attitude towards pain management in pigs was shown by respondents to the current survey, as 88% of farmers agreed that 'recognising and managing pain is an important part of pig keeping', and 70% wished to know more about pain and how to treat it in this species. A large proportion of both farmers and veterinarians agree with the statement: 'pigs recover better with pain relief'.

Conclusions

This survey has demonstrated that anti-inflammatory drugs are widely used to treat lameness in breeding pigs, with high agreement by participants that pigs recover better with pain relief, and, overall, there was a positive attitude to the recognition and management of pain. However, this research also highlights potential barriers to the increased use of pain relief for pigs, identifying lack of up-to-date knowledge, poor communication between farmers and veterinarians, and the fact that many older male respondents gave low scores for painful conditions. Understanding the attitudes of pig farmers and veterinarians to pain and pain management could help target future education, training and research strategies in this area.

Conflict of interest statement

Neither of the authors of this paper has a financial or personal relationship with other people or organisations that could inappropriately influence or bias the content of this paper.

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307 **References**

308 BPEX, 2014. British Pig Executive: UK Pig Industry Structure.
309 http://www.bpex.org.uk/prices-facts-figures/industry-structure/ (accessed 5 May 2014).

310 Coleman, G., 1998. Predicting stockperson behaviour towards pigs from attitudinal and job-
311 related variables and empathy. Applied Animal Behaviour Science 58, 63–75.

312 DEFRA, 2014. Department for Environment, Food & Rural Affairs. Structure of the
313 agricultural industry in England and the UK at June.
314 https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-
315 industry-in-england-and-the-uk-at-june (accessed 11 August 2014).

316 Engelhardt, G., Homma, D., Schlegel, K., Utzmann, R., Schnitzler, C., 1995. Anti-
317 inflammatory, analgesic, antipyretic and related properties of meloxicam, a new non-
318 steroidal anti-inflammatory agent with favourable gastrointestinal tolerance.
319 Inflammation Research 44, 423–433.

320 Flecknell, P., 2008. Analgesia from a veterinary perspective. British Journal of Anaesthesia
321 101, 121–124.

322 Guatteo, R., Levionnois, O., Fournier, D., Guémené, D., Latouche, K., Leterrier, C.,
323 Mormède, P., Prunier, A., Servière, J., Terlouw, C. et al., 2012. Minimising pain in farm
324 animals: The 3S approach – "Suppress , Substitute , Soothe". Animal 6, 1261–1274.

325 Hemsworth, P.H., Coleman, G.J., Barnett, J.L., 1994. Improving the attitude and behaviour of
326 stockpersons towards pigs and the consequences on the behaviour and reproductive
327 performance of commercial pigs. Applied Animal Behaviour Science 39, 349–362.

328 Hewson, C.J., Dohoo, I.R., Lemke, K.A., Barkema, H.W., 2007. Canadian veterinarians' use
329 of analgesics in cattle, pigs, and horses in 2004 and 2005. The Canadian Veterinary
330 Journal 48, 155–164.

331 Huxley, J., Whay, H., 2007. Attitudes of UK veterinary surgeons and cattle farmers to pain
332 and the use of analgesics in cattle. Cattle Practice 13, 81–85.

333 Huxley, J.N., Whay, H.R., 2006. Current attitudes of cattle practitioners to pain and the use of
334 analgesics in cattle. Veterinary Record 159, 662–668.

335 Kielland, C., Skjerve, E., Osterås, O., Zanella, A.J., 2010. Dairy farmer attitudes and empathy
336 toward animals are associated with animal welfare indicators. Journal of Dairy Science
337 93, 2998–3006.

338 Laven, R.A., Huxley, J.N., Whay, H.R., Stafford, K.J., 2009. Results of a survey of attitudes
339 of dairy veterinarians in New Zealand regarding painful procedures and conditions in
340 cattle. New Zealand Veterinary Journal 57, 215–220.

341 Lorena, S.E.R.S., Luna, S.P.L., Lascelles, B.D.X., Corrente, J.E., 2013. Attitude of Brazilian
342 veterinarians in the recognition and treatment of pain in horses and cattle. Veterinary
343 Anaesthesia and Analgesia 40, 410–418.

344 Mellor, D.J., Fisher, M, W., Stafford, K.J., 2008. A cost-benefit analysis of pain relief for
345 farm animals. In: Scientific Assessment and Management of Animal Pain, First Ed.
346 World Organisation of Animal Health, pp. 47–55.

347 NOAH, 2014. National Office of Animal Health: Veterinary Medicine Classifications.
348 http://www.noahcompendium.co.uk/Compendium/Overview/-42802.html (accessed 5
349 May 2014).

350 Prunier, A., Mounier, L., Le Neindre, P., Leterrier, C., Mormède, P., Paulmier, V., Prunet, P.,
351 Terlouw, C., Guatteo, R., 2013. Identifying and monitoring pain in farm animals: A
352 review. Animal 7, 998–1010.

353 Raekallio, M., Heinonen, K.., Kuussaari, J., Vainio, O., 2003. Pain Alleviation in Animals:
354 Attitudes and Practices of Finnish Veterinarians. The Veterinary Journal 165, 131–135.

355 Thomsen, P.T., Anneberg, I., Herskin, M., 2012. Differences in attitudes of farmers and
356 veterinarians towards pain in dairy cows. The Veterinary Journal 194, 94–97.

357 Thomsen, P.T., Gidekull, M., Herskin, M.S., Huxley, J.N., Pedersen, A.R., Ranheim, B.,
358 Whay, H.R., 2010. Scandinavian bovine practitioners' attitudes to the use of analgesics
359 in cattle. Veterinary Record 167, 256–258.

360 VMD, 2011. Veterinary Medicines Directorate: Product information database.
361 http://www.vmd.defra.gov.uk/ProductInformationDatabase/ (accessed 5 May 2014).

362 Whay, H., Huxley, J., 2005. Pain Relief in Cattle: A Practitioners Perspective. Cattle Practice
363 13, 81–85.

364 Wilson, R., Holyoake, P., Cronin, G., Doyle, R., 2014. Managing animal wellbeing: A
365 preliminary survey of pig farmers. Australian Veterinary Journal 92, 206–212.

366

Table 1

Demographic profile of survey respondents.

Age group	Farmers				Veterinarians			Total
	Male	Female	No reply	Total	Male	Female	Total	
25 to 44	16	0	-	16	11	17	28	44
45 to 64	35	4	-	39	18	2	20	59
65+	6	1	-	7	4	0	4	11
No reply	-	-	2	2	-	-	-	2
Total	57	5	2	64	33	19	52	116

Table 2

Percentage of farmers and veterinarians who use (farmers) or use/prescribe (veterinarians) analgesic drugs by active ingredient.

Drug (as per active ingredient)	Veterinarians (%)	Farmers (%)
Meloxicam	92.3	41.0
Dexamethasone	69.2	37.7
Ketoprofen	50.0	14.8
Flunixin	36.5	9.8
Sodium salicylate	38.5	1.6
Paracetamol	28.8	3.3
Tolfenamic acid	15.4	6.6

373 **Table 3**

374 **Median (first and third quartile), and mean (standard error of the mean) pain scores as allocated by farmers and veterinarians, by**

375 **gender and age group for eight conditions in breeding pigs, respectively.**

Condition scored	Farmer vs. Veterinarian			Gender			Age group			
	Farmer	Vet	Effect, *P* value	Female	Male	Effect, *P* value	25 to 44	45 to 64	65 +	Effect, *P* value
Broken leg	10 (9,10) 8.8 (0.3) *n* = 59	10 (9,10) 9.5 (0.1) *n* = 52	0.76, 0.448	10 (10,10) 9.7 (0.2) *n* = 23	10 (9,10) 9.1 (0.2) *n* = 87	-1.45, 0.147	10 (9.25,10) 9.5 (0.1) *n* = 44	10 (9,10) 9.4 (0.2) *n* = 56	8 (5.25,9.25) 6.9 (1.0) *n* = 10	3.07, 0.002
Infectious mastitis	8 (6.75,9) 7.5 (0.3) *n* = 54	7.5 (6,8) 7.3 (0.2) *n* = 52	-1.45, 0.146	8 (6,9) 7.7 (0.3) *n* = 23	8 (6.75,9) 7.4 (0.2) *n* = 82	-0.63, 0.528	8 (7,9) 7.8 (0.2) *n* = 43	8 (6.25,8) 7.2 (0.2) *n* = 53	7 (5.5,8) 6.9 (0.5) *n* = 9	1.90, 0.058
Difficult farrowing	7 (5,9) 6.7 (0.4) *n* = 55	8 (6,9) 7.3 (0.3) *n* = 52	0.81, 0.417	9 (7,9) 8.1 (0.4) *n* = 22	7 (5,8) 6.8 (0.2) *n* = 84	-2.65, 0.008	8 (6,9) 7.7 (0.3) *n* = 43	8 (5.75,9) 6.9 (0.3) *n* = 54	5 (4,6) 4.9 (0.5) *n* = 9	3.29, 0.001
Lameness – minimal weight bearing	7 (5,8) 6.3 (0.2) *n* = 58	8 (6,8) 7.0 (0.3) *n* = 52	2.36, 0.018	7 (5,8) 6.5 (0.4) *n* = 23	7 (5.75, 8) 6.8 (0.2) *n* = 86	0.55, 0.580	7 (5,8) 6.8 (0.3) *n* = 44	7 (5,8) 6.6 (0.2) *n* = 55	7 (6,8) 7.0 (0.3) *n* = 10	0.18, 0.860
Shoulder sore	5 (4,8) 5.6 (0.3) *n* = 55	6 (4,7) 5.6 (0.3) *n* = 52	0.18, 0.859	7 (5.5,8) 6.5 (0.3) *n* = 21	5 (4,7) 5.5 (0.2) *n* = 84	-1.94, 0.053	6 (5,7) 6.1 (0.3) *n* = 43	5 (4,7) 5.5 (0.3) *n* = 55	6 (2,7) 4.6 (1.1) *n* = 7	1.46, 0.143
Respiratory disease	5 (3,7) 5.1 (0.3) *n* = 54	5(3,7) 5.1 (0.3) *n* = 52	-0.09, 0.930	5 (3,7) 5.1 (0.5) *n* = 22	5 (3,7) 5.1 (0.3) *n* = 82	-0.07, 0.941	5.5 (4,7) 5.6 (0.3) *n* = 44	5 (3,6) 4.6 (0.3) *n* = 52	5.5 (3,8.5) 5.5 (1.1) *n* = 8	1.45, 0.148
Gastrointestinal disease	6 (3,8) 5.6 (0.4) *n* = 50	5 (3,6) 4.5 (0.3) *n* = 51	-2.27, 0.023	5.5 (4,7) 5.4 (0.4) *n* = 22	5 (3,7) 5.0 (0.3) *n* = 78	-0.69, 0.492	6 (4,7.5) 5.7 (0.4) *n* = 41	5 (2,7) 4.7 (0.4) *n* = 53	3.5 (2.25, 8) 4.3 (1.3) *n* = 6	2.01, 0.044

Normal farrowing	3 (2,5.75) 3.8 (0.3) *n* = 57	5 (3, 6.75) 4.5 (0.3) *n* = 52	1.70, 0.089	5.5 (3,7.75) 5.4 (0.5) *n* = 24	3 (2,5) 3.7 (0.2) *n* = 84	-3.14, 0.002	5 (3,7) 4.5 (0.4) *n* = 43	3 (2,6) 4.0 (0.3) *n* = 55	2 (0.75,5) 2.8 (0.9) *n* = 10	2.26, 0.024
All conditions	7 (4,8) 6.3 (0.1)	7 (5,8) 6.4 (0.1)	0.36, 0.720	7 (5,9) 6.8 (0.2)	6 (4,8) 6.2 (0.1)	-2.52, 0.012	7 (5,9) 6.7 (0.1)	7 (4,8) 6.1 (0.1)	6 (3,8) 5.4 (0.3)	3.81, 0.001

376 **Table 4**

377 **Frequency (and %) of farmers and veterinarians (vet) in agreement with statements about pain, and the use of pain relief, in pigs.**

Statement	Farmer/ vet	Frequency (%)						Farmers vs. veterinarians	
		Strongly agree (1)	Agree (2)	Neither (3)	Disagree (4)	Strongly disagree (5)	Don't know/no reply	Coded mean	*P* value
It is difficult to recognise pain in pigs	Farmer	2 (3.1)	19 (29.7)	3 (4.7)	24 (37.5)	13 (20.3)	3 (4.7)	3.1	
	Vet	3 (5.8)	18 (34.6)	7 (13.5)	19 (36.5)	5 (9.6)	0 (0.0)	3.3	0.132
Pain relief drugs are too expensive for pig farmers to use regularly	Farmer	3 (4.7)	9 (14.0)	17 (26.6)	22 (34.4)	6 (9.4)	7 (10.9)	3.4	
	Vet	6 (11.5)	9 (17.3)	10 (19.2)	20 (38.5)	5 (9.6)	2 (3.9)	3.2	0.646
I feel I know enough about pain and how to treat pain in pigs	Farmer	6 (9.4)	25 (39.0)	14 (21.9)	14 (21.9)	2 (3.1)	3 (4.7)	2.7	
	Vet	4 (7.7)	15 (28.9)	16 (30.8)	15 (28.8)	2 (3.8)	0 (0.0)	2.9	0.223
There aren't enough pain relief drugs available to use on pigs with painful conditions	Farmer	0 (0.0)	9 (14.0)	19 (29.7)	14 (21.9)	3 (4.7)	19 (29.7)	3.2	
	Vet	4 (7.7)	4 (7.7)	11 (21.1)	29 (55.8)	4 (7.7)	0 (0.0)	3.5	0.064
Pigs are not as sensitive to pain as humans	Farmer	4 (6.3)	16 (25.0)	7 (10.9)	15 (23.4)	16 (25.0)	6 (9.4)	3.4	
	Vet	1 (1.9)	8 (15.4)	4 (7.7)	16 (30.8)	19 (36.5)	4 (7.7)	3.9	0.056
Pigs recover better with pain relief	Farmer	12 (18.7)	34 (53.1)	4 (6.3)	0 (0.0)	1 (1.6)	13 (20.3)	1.9	
	Vet	24 (46.2)	25 (48.1)	2 (3.8)	0 (0.0)	1 (1.9)	0 (0.0)	1.6	0.041
I regularly discuss pain and pain relief options with pig farmers (vets) or my veterinary surgeon (farmer)	Farmer	5 (7.8)	14 (21.9)	19 (29.7)	19 (29.7)	5 (7.8)	2 (3.1)	3.1	
	Vet	5 (9.6)	27 (52.0)	10 (19.2)	10 (19.2)	0 (0.0)	0 (0.0)	2.5	0.003

Fig. 1. Numbers of anti-inflammatory drugs used by farmers and veterinarians responding to survey questionnaire.

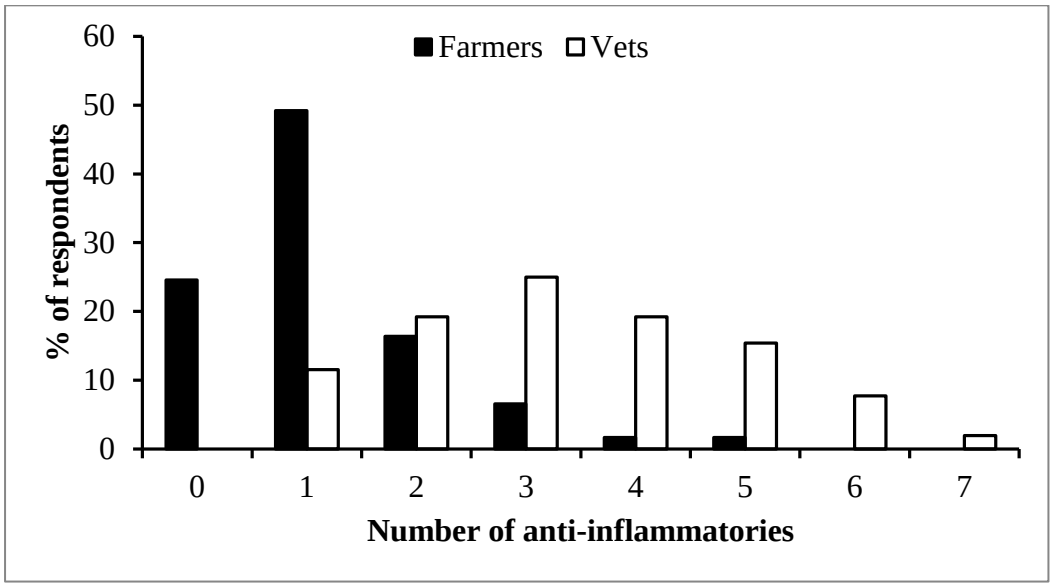
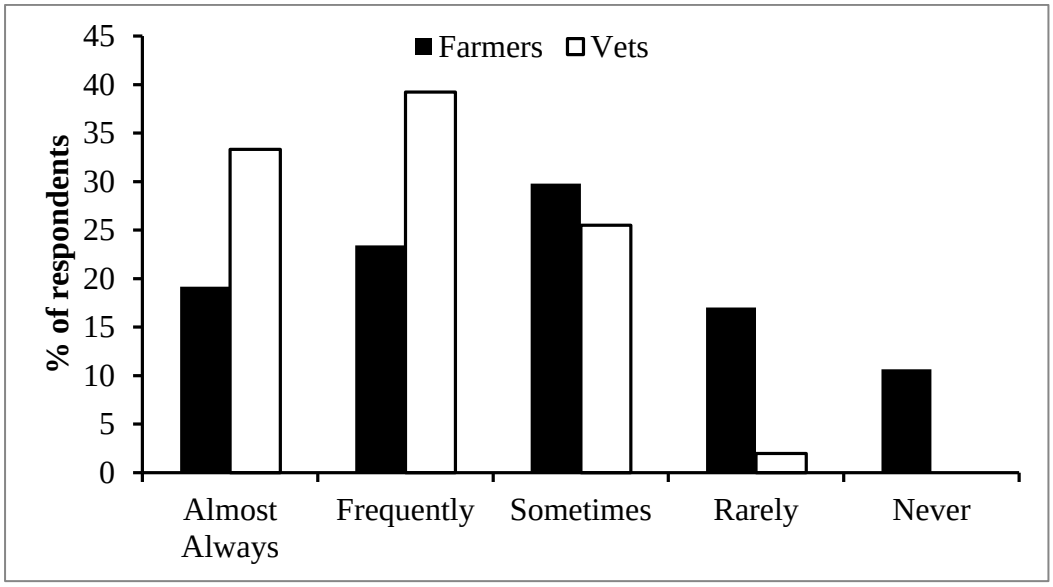
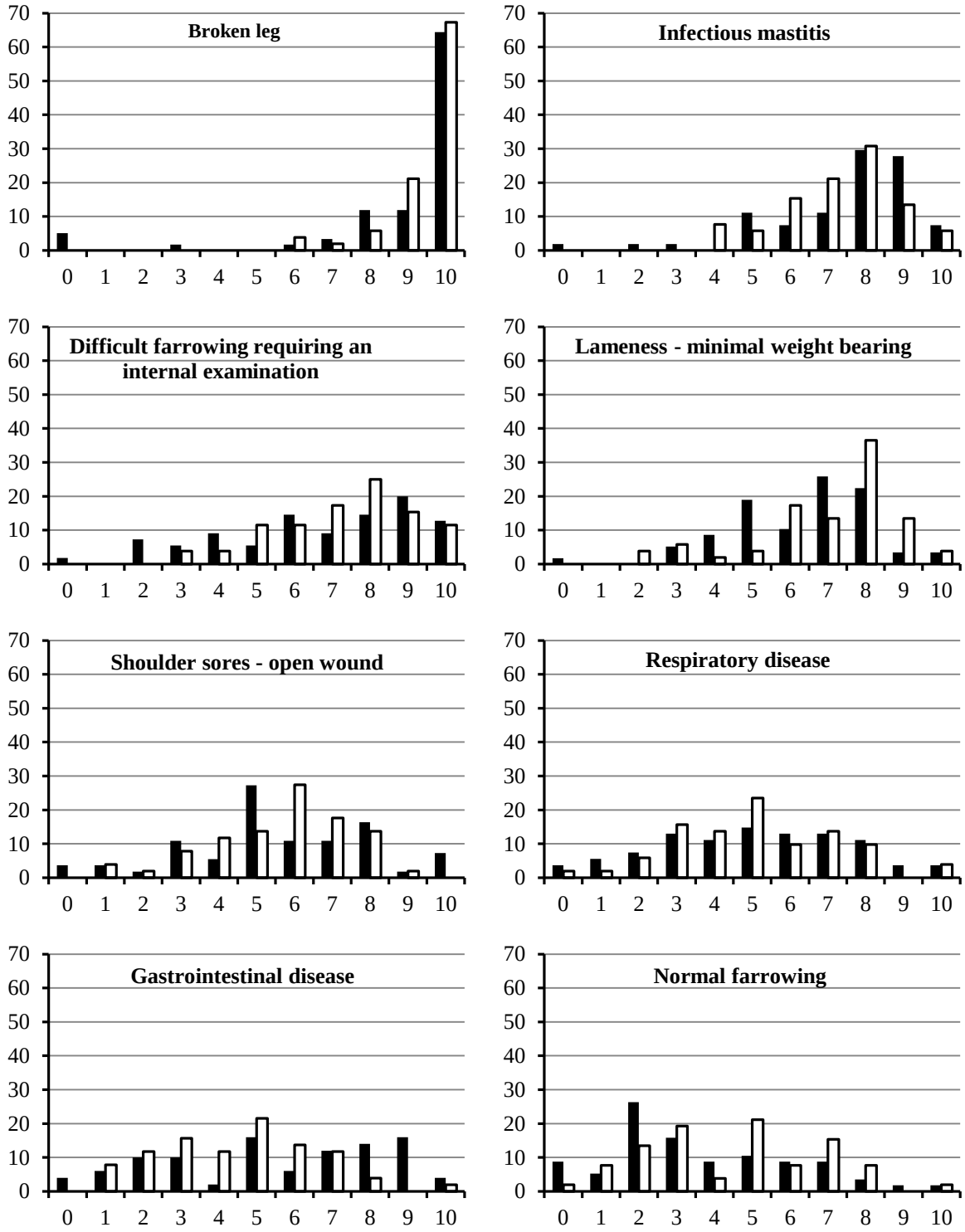


Fig. 2. Frequency ('almost always', 'frequently', 'sometimes', 'rarely', and 'never') with which anti-inflammatory drugs are used (or prescribed) by farmers (in black) and veterinarians (in white) for the treatment of lameness in breeding pigs.



386 Fig. 3. Distribution of pain scores (from ‘0’ [no pain] to ‘10’ [most severe pain]) for eight
387 conditions surveyed in breeding pigs as given by farmers (in black) and veterinarians (in
388 white).



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